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wife during sleep; the magnetism of the right side of the male, acting on the left side of the female, produces females. But the number of ridiculous theories is nearly endless, and we stop here. Connected with these theories are formulæ for making the children resemble either parent. These have been stated in a most complex manner by Girou, but are too lengthy for presentation. The gist of them lies in his view that the internal organization is most often transmitted to the same sex, the external to the opposite, and heredity plays a great rôle; if a father resembles his mother, his daughter will resemble him, etc. This subject, like the rest, has received a good deal of attention from theorists, but the entire matter is confused and contradictory, both with facts and with itself in any one author, and becomes chaotic when different writers are compared. This part of the subject awaits scientific investigation.

On the physiology of menstruation, consult, besides Janke, *Physiologie der Zeugung*. GRÜNHAGEN. Leipzig, 1883.

This author presents in a condensed form what is known through various investigations upon the subject of ovo- and spermatogenesis, menstruation, methods of reproduction, etc., etc. Concerning the simpler phenomena of ovogenesis, there is considerable agreement, but hundreds of investigations have been directed toward the solution of certain problems connected with spermatogenesis. We may roughly recognize the following schools: (1) Those who, like Biondi, believe that only one sort of cells exists in the testicular epithelial layer, and that the large cells near the wall of the follicle bud off nuclear bodies, each of which, by karyokinetic division, finally produces a group of cells from which the spermatozoa arise by direct metamorphosis. These cells or *spermatoblasts* are arranged in a column whose base embraces the perennial mother-cell. (2) Those who think the basal cell is the female part of the original germ-cell, and will be thrown off. (3) Those who think the basal cell is a distinct kind of cell with which the spermatozoa produced outside it have secondarily conjugated for nutritive purposes. (4) Those who believe these cells are only supporting elements, furnishing a sort of spongy net within the meshes of which the spermatozoa are held until discharged. It is the first two schools whose difference is of radical interest, though it may be mentioned that Balbiani thinks the "yolk nucleus" sometimes seen in eggs represents an epithelial (male) cell from the mother which has fertilized the egg, and that a similar fertilization of female protoplasm from the father takes place in spermatogenesis. But we pass on to the main subject, and refer mainly to Tillier's work.<sup>1</sup> In animals there are definite seasons when the reproductive activities are at their height, the physiological state being known as "heat" or "rut." This period has been established in connection with nutrition and climatic conditions favorable to the rearing of the young. These periods usually occur at the same time in the two sexes. Both undergo the profoundest physiological and psychological changes, everything seeming to subserve reproduction. (On many of these points, cf. Darwin). When we turn to man, do we find anything comparable? At the period of puberty, the human youth of both sexes develop special characters that have a reproductive significance, but these characteristics are practically permanent. In the female, however, there is a monthly rhythm supposed to be comparable to that in animals. The medical dictum now is that menstruation is ovulation, or marks the successive completions of maturations of ova and the bursting of a Graafian follicle, setting free the ovum. The ovum is received by the Fallopian tubes and carried to the uterus by the action of cilia. Meanwhile the spermatozoa, if present, swim actively against the ciliary

<sup>1</sup>For title see below.

current, and meet the egg either at the surface of the ovaries or in the tube, or at times only in the uterus. The point of meeting determines the relative ages of the two elements, and is supposed to be of significance in determining the sex of the product. The egg, when fertilized, is an independent being that becomes parasitic upon the uterine walls, causing the neighboring cells to proliferate and grow around it, and successively to develop the placenta. This effect of the egg upon the tissues is exerted upon other organs, as seen in abdominal pregnancy, and is in itself a very remarkable phenomenon, which can be understood only when the general principles of parasitism as exhibited throughout nature are understood. Fertilization has other effects, such as may be felt by the mother, but its first evident effect is the suppression of the menses. How is this accomplished? Menstruation is the periodic congestion of the uterus and ovaries, succeeding a gradual hypertrophy of the uterine walls and ending by a sloughing away of the extra growth. What is the significance of this? Theory alone gives its uncertain answer to both questions. We know but few facts in addition to the above enumerated ones. We know that conceptions are most frequent just immediately succeeding the flow. Pflüger thinks the old mucosa has been taken away to prepare a fresh surface for the attachment of the egg. But cases of conception at any portion of the period are known, and if such occur just before a flow, the flow is still suppressed. Lowenthal's view is that the length of the period is fixed by the length of time an egg may remain unimpregnated in the uterus before it dies. The egg, on this theory, is supposed to fixate itself before fertilization and to cause the mucosa proliferation (just as if fertilized), but when fertilization is delayed until the egg dies, an abortion takes place which is menstruation. Then the uterine congestion affecting the ovaries causes a new follicle to burst, and the experiment is repeated. Similarly Flesch holds menstruation to be a washing away of an egg too old for fertilization. Cases are known of menstruation continuing after complete removal of both ovaries, which fact seems fatal to this ingenious theory. To be sure, the menses, like other sexual characters, have become established because of the presence and development of the ovaries. (See PALLER, "*Philosophy of Menstruation, Conception and Sterility*," in Dr. Serguis's series of American Clinical Lectures, Vol. III, No. 3, N. Y., 1877). Once established, there seems to be a sort of independence in the activity of both organs which usually coincide in their periods; such is the view of Beigel and Reinstadter, but Foekkistow thinks the fact that ripe follicles have been found in the intermenstrual period, shows that ovulation is not periodical but continuous. Carpenter advocates the view that the egg does not reach the uterus to be fertilized until a week or more after the cessation of the flow, and hence the Levitical prohibition of coitus until after this time. On the other hand, Loewenhardt thinks the egg leaves the follicle before menstruation; and the independence of ovulation from menstruation is shown, according to Winckel, by the occurrence of ripe follicles in females who have never menstruated. Sappey has shown that at three years of age the ovaries are furnished with their complete stock of eggs (nearly a million), and Morgagni relates a case of a babe four months old which menstruated. Cases of continuous menstruation as well as continuous lactation are known. Nursing usually stops menstruation, and if excessive, may cause atrophy of the ovaries; or if suddenly stopped, causes ovarian inflammation. The reflex connection of the breasts and reproductive organs is also testified in other ways. Excessive continence, as well as excessive venery, causes a cessation of the menses, accompanied by sterility. Fertility is related to the vigor of menstruation, but not in an absolute manner. Conceptions of non-menstruating women are known, but cessation of menses, of fertility and of ovulation occur

simultaneously at the change of life (See Tilt in first section). This is about the extent of our knowledge, but no theory has satisfactorily combined these facts into a harmonious whole. Cases of male menstruation are known; the reviewer has given reason for believing in the presence of a monthly rhythm that affects all the psychic as well as biological activities of both sexes. (*A Study of Dreams*. This JOURNAL, vol. i, 1888. pp. 387 *et seq.*).

Let us look a little further into the subject of periodicity, which is so closely related to or dependent upon the presence of the reproductive organs. First consult:

*Periodische Psychosen*. KIRN. Stuttgart, 1875.

Esquirol has formulated the laws of periodicity in disease: disease may be 1st, intermittent due to the cyclic development of parasites; or 2nd, due to definitely recurring causes, or 3rd, as related with menstrual periods, or 4th, due to other diseases themselves due to periodic conditions, and 5th, due to no assignable cause. The length of the periods may be very variable from hours to days or weeks or months or even years. The length of the relation of the depressed, the normal and the exalted portions of the periods of cyclical insanity may be various and may change progressively during the run of the affection. Certain general observations may be made. Periodic diseases, (mental diseases, or those in which psychic symptoms are very prominent, form the largest class of periodic diseases), develop usually during the adolescent stage of human development and are common again at the climacteric; more than half of the cases are accompanied by sexual exaltation or by a desire for stimulants. Cases often show an alternation of melancholy and mania separated by clear intervals. Such cases are graphically represented by a curve rising and falling successively through a normal level. A typical case of cyclic or circular psychosis presented a normal interval of some months followed by melancholy that turned to mania with a couple of days clear interval separating the two states, at the same time the sense of double personality was intense in both conditions of abnormality. The periods themselves may be grouped; several fall close together and then follows a long free interval succeeded by another group of waves. Small waves may be found superimposed upon the larger ones. Finally cases are considered in which each wave begins with either exaltation or depression and ends with the same phase, the opposite condition forming the middle of the wave. These cases are united with disease of the reproductive organs and occur in connection with the menstrual period. Krafft-Ebing refers the sexual trouble to a neurosis; but Kirn reminds us that this neurosis was stimulated by the periodic ovulation causing a wave of cerebral hyperæmia. One case showed that the brain congestion was due to a periodic swelling of the thyroid, pressing the jugular veins.

*Ein Beitrag zur Lehre vom menstrualen Irresein*. BARTEL. Inaug. Dissert. Berlin, 1887.

After noting that one-third of the cases of female insanity are traceable to menstrual disturbances this author classifies cases of periodic disease into those whose period coincides with the menstrual month, and those that do not. The first-class has two sub-divisions, those truly insane and those nervously disturbed without real mental alienation. The brochure is in the main a detailed study of a single case.

An able handling of the subject is seen in the next work.

*Ueber die Gesetze des periodischen Irreseins*. KOSTER. Bonn, 1882.

The moon is from 47 to 55 thousand miles nearer the earth in perigee than in apogee and exerts a correspondingly greater effect ( $\frac{1}{8}$ ) upon